Name: Date:

Exam: Function Reflections (Solution version 8)

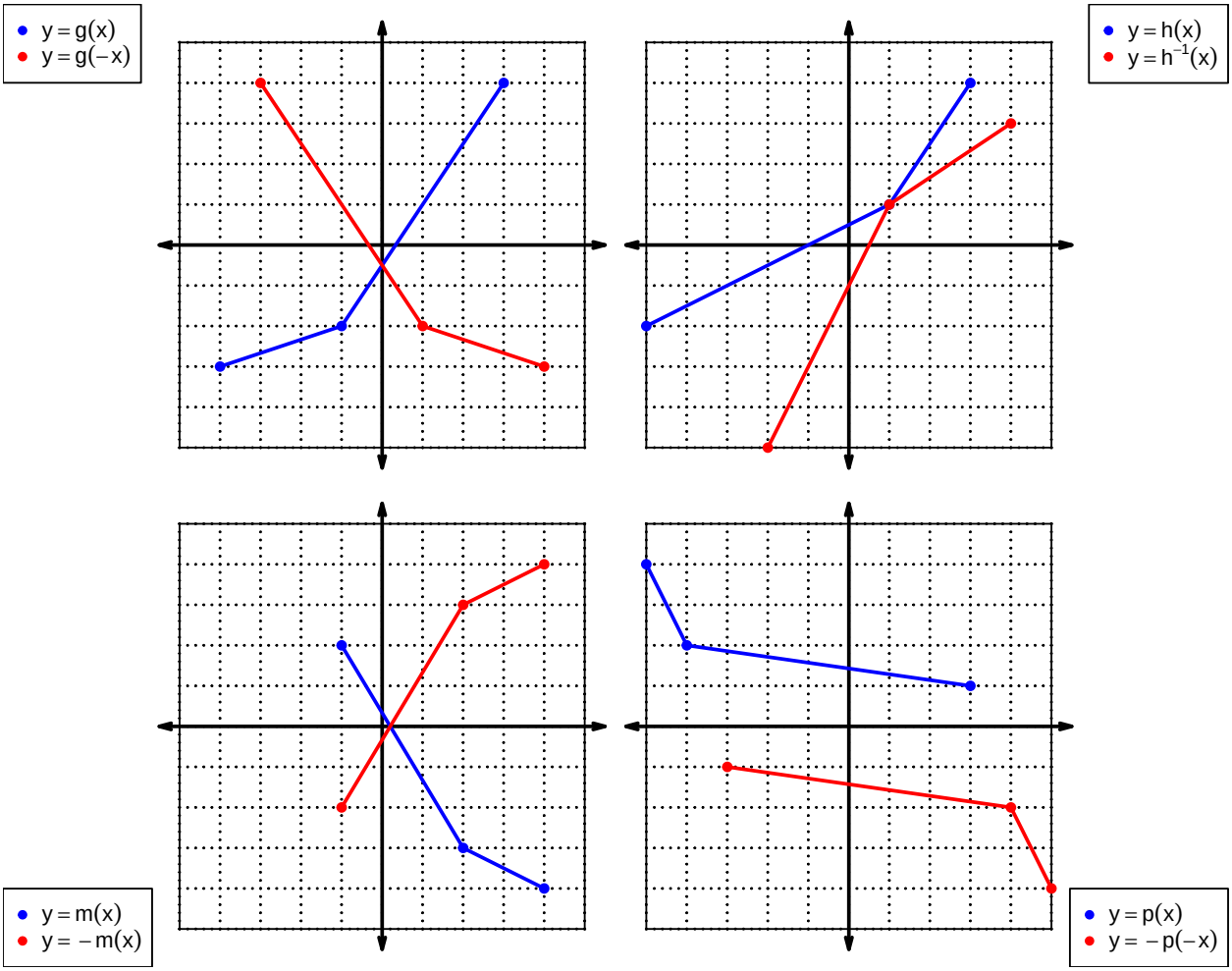
1. Let function f be defined by the polynomial below:

$$f(x) = -5x^5 + 8x^4 - 3x^3 - 9x^2 + 4x - 7$$

Draw lines that match each function reflection with its polynomial:

Reflections	Polynomials
$-f(-x)$	$-5x^5 - 8x^4 - 3x^3 + 9x^2 + 4x + 7$
$-f(x)$	$5x^5 - 8x^4 + 3x^3 + 9x^2 - 4x + 7$
$f(-x)$	$5x^5 + 8x^4 + 3x^3 - 9x^2 - 4x - 7$

2. In each xy plane shown below, a function is graphed with blue. Draw the indicated reflections (as a second curve, indicated in legend) with black (or with whatever you have). The x axis is horizontal and the y axis is vertical (as typical), and the scale is equal on both axes.



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For all questions on this page, the functions f, g, and h are defined by the table below.

x	$f(x)$	$g(x)$	$h(x)$
1	4	9	2
2	7	4	6
3	5	6	4
4	6	7	8
5	1	2	1
6	8	1	7
7	3	3	9
8	9	5	3
9	2	8	5

3. Evaluate $g(1)$.

$$g(1) = 9$$

4. Evaluate $f^{-1}(6)$.

$$f^{-1}(6) = 4$$

5. Assuming h is an **even** function, evaluate $h(-7)$.

If function h is even, then

$$h(-7) = 9$$

6. Assuming f is an **odd** function, evaluate $f(-5)$.

If function f is odd, then

$$f(-5) = -1$$

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7. A function, f, is **even** if $f(x) = f(-x)$ for all x in the domain. A function, g, is **odd** if $g(x) = -g(-x)$ for all x in the domain.
   Let polynomial p be defined with the following equation:

$$p(x) = -x^2 + x$$

   a. Express $p(-x)$ as a polynomial in standard form.

$$p(-x) = -(-x)^2 + (-x)$$
$$p(-x) = -x^2 - x$$

   b. Express $-p(-x)$ as a polynomial in standard form.

$$-p(-x) = -\left(-x^2 - x\right)$$
$$-p(-x) = x^2 + x$$

   c. Is polynomial p even, odd, or neither?

neither

   d. Explain how you know the answer to part c.

We see that $p(x)$ is not equivalent to either $p(-x)$ or $-p(-x)$, so p is neither even nor odd.

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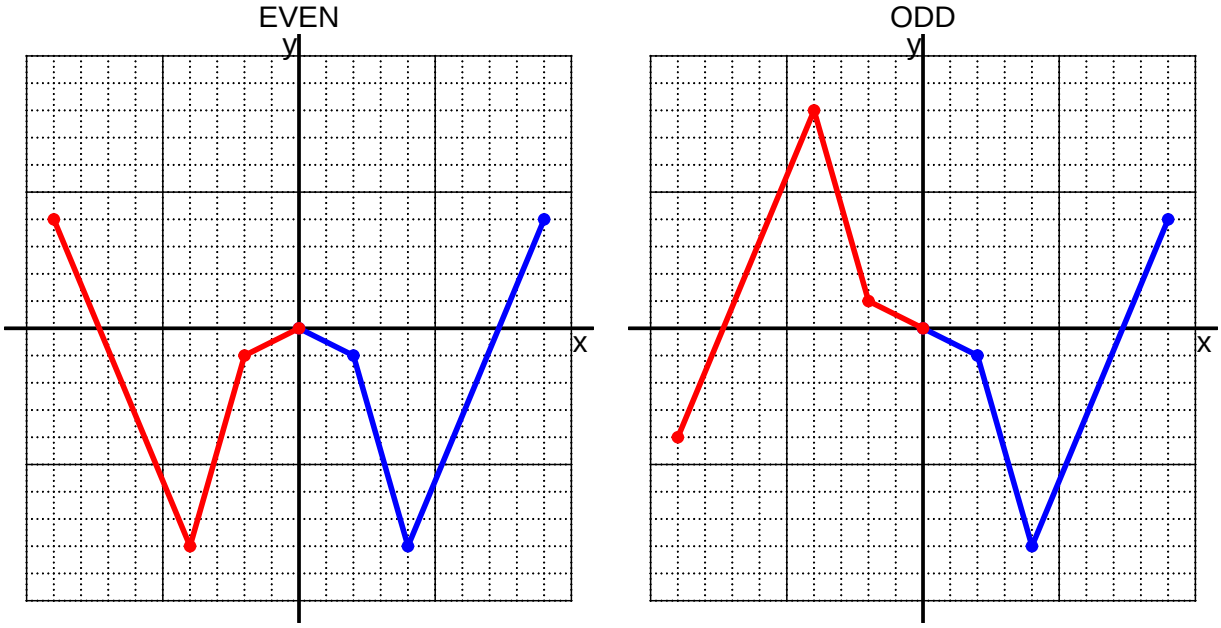
8. I have drawn half of a function. Draw the other half to make it even or odd.



9. Let function f be defined with the equation below.

$$f(x) = 8x - 9$$

a. Evaluate $f(6)$.

step 1: multiply by 8
step 2: subtract 9

$$f(6) = 8(6) - 9$$
$$f(6) = 39$$

b. Evaluate $f^{-1}(47)$.

step 1: add 9
step 2: divide by 8

$$f^{-1}(x) = \frac{x+9}{8}$$
$$f^{-1}(47) = \frac{(47)+9}{8}$$
$$f^{-1}(47) = 7$$

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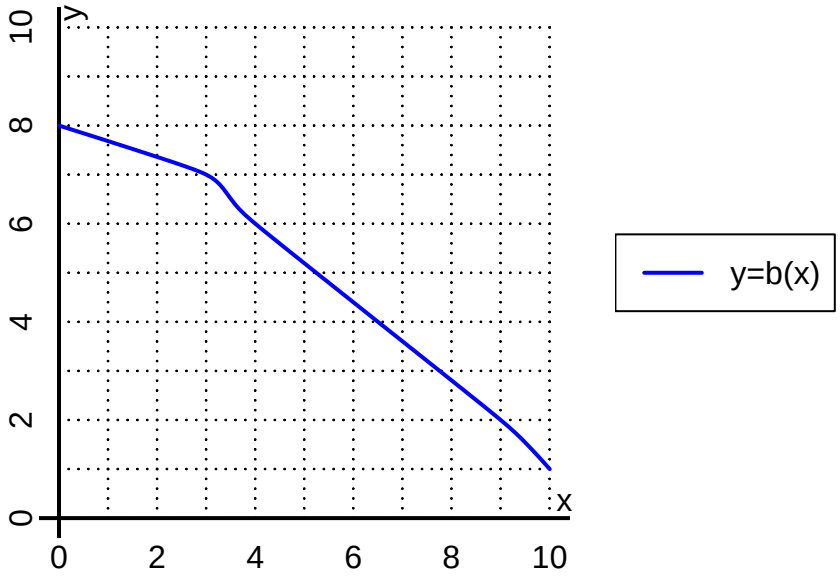
10. The function b is represented by the curve $y = b(x)$ graphed below.



a. Evaluate $b(4)$.

$b(4) = 6$

b. Evaluate $b^{-1}(2)$.

$b^{-1}(2) = 9$

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11. Function f is defined by the table below.

    a. Complete the columns for $-f(x)$ and $f(-x)$ and $-f(-x)$.

x	$f(x)$	$-f(x)$	$f(-x)$	$-f(-x)$
-2	-7	7	7	-7
-1	9	-9	-9	9
0	0	0	0	0
1	-9	9	9	-9
2	7	-7	-7	7

b. Is function f even, odd, or neither?

odd

c. How do you know the answer to part b?

Function f is odd because column $-f(-x)$ matches column $f(x)$ exactly.